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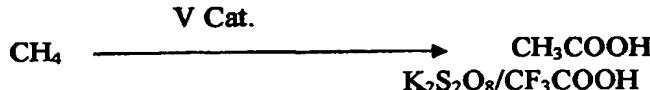
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(54) Title: VANADIUM CATALYSTS AND PROCESS FOR THE DIRECT CONVERSION OF METHANE INTO ACETIC ACID



(I)

(57) Abstract: The invention consists on the utilization of complexes of vanadium (in the +4 and +5 oxidation states) with bi- or poly-dentate ligands coordinated by nitrogen and oxygen (N,O) or by oxygen

and oxygen (O,O) atoms, namely derivatives of aminoalcohols, (hydroxyimino)dicarboxylic acids, hydroxypyranones, trifluoroacetic acid, triflic acid or inorganic acid, as catalysts for the direct single-pot conversion, under mild conditions, of methane in acetic acid, either in the absence or in the presence of carbon monoxide, and in the presence of a peroxodisulfate salt (K₂S₂O₈), in trifluoroacetic acid (CF₃COOH), according to the general reaction (I).

INTERNATIONAL SEARCH REPORT

national Application No

PCT/PT 03/00015

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 B01J31/04 B01J31/18 B01J31/22 B01J31/26 B01J31/36
 C07C51/145

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 IPC 7 B01J C07C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TANIGUCHI Y ET AL: "Highly Efficient Vanadium-Catalyzed Transformation of CH ₄ and CO to Acetic Acid" ORGANIC LETTERS, ACS, WASHINGTON, DC, US , vol. 1, no. 4, 8 July 1999 (1999-07-08), pages 557-559, XP002286128 cited in the application the whole document ---	1-4
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Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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- *A* document defining the general state of the art which is not considered to be of particular relevance
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Date of the actual completion of the International search

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INTERNATIONAL SEARCH REPORT

national Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	ASADULLAH M ET AL: "One-step carboxylation reaction of saturated hydrocarbons with CO by Co(OAc) ₂ catalyst under mild conditions" APPLIED CATALYSIS A: GENERAL, ELSEVIER SCIENCE, AMSTERDAM, NL, vol. 194-195, 13 March 2000 (2000-03-13), pages 443-452, XP004272248 ISSN: 0926-860X the whole document ---	1-4
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National Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	CHEN C-T ET AL: "Catalytic Nucleophilic Acyl Substitution of Anhydrides by Amphoteric Vanadyl Triflate" ORGANIC LETTERS, ACS, WASHINGTON, DC, US , vol. 3, no. 23, 20 October 2001 (2001-10-20), pages 3729-3732, XP002286134 cited in the application the whole document ---	3
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National Application No
CN/PT 03/00015

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	<p>REIS P M ET AL: "Single-Pot Conversion of Methane into Acetic Acid in the Absence of CO and with Vanadium Catalysts Such as Amavadine" ANGEWANDTE CHEMIE. INTERNATIONAL EDITION, WILEY-VCH VERLAG, WEINHEIM, DE , vol. 42, no. 7, 17 February 2003 (2003-02-17), pages 821-823, XP002286136 the whole document</p> <p>-----</p>	1-4
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INTERNATIONAL SEARCH REPORT
Information on patent family members

national Application No

PT/PT 03/00015

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